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ABSTRACT

A computerized system set up at the University of Illinois for monitoring graduates and their experiences in the labor market is discussed, along with trends among graduates that have occurred over an 11-year period. The university initiated studies of graduates in 1972. About one-third of the content of the surveys is devoted to vocational questions, 20% to postgraduation educational experiences, and the remaining 50% to respondents' views about the institution and its programs. Comparisons are made for bachelor's graduates one year after graduation by field of study for 1974, 1976, 1977, 1979, and 1982. The following disciplines are covered: business, education, engineering, mathematics and sciences, social sciences, and humanities. The comparison concerns the following variables: the unemployment rate, the percentages of students who secured their first job prior to graduation and after graduation, level of job satisfaction, attitudes toward the college major, and an average salary index. Also considered are longitudinal data on these variables for the class of 1973. Based on the results, it is suggested that post-graduation experiences of college graduates may not match the general job market trends for graduates. (SW)

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A SYSTEM FOR MONITORING THE ADJUSTMENT OF GRADUATES TO THE CHANGING JOB MARKET

Paper Presented at
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by

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Ann K. Dickey, Chair
Forum Publications Editorial
Advisory Committee

A SYSTEM FOR MONITORING THE ADJUSTMENT OF GRADUATES TO THE CHANGING JOB MARKET

The job market for college graduates changes constantly. The past decade or so has provided a dramatic illustration of this changing environment for the employment of graduates. During that period increased emphases have been placed on jobs for graduates in science, engineering, computer science, and business, and there has been a decline in jobs for graduates in teaching and liberal arts.

College administrators and student counselors should keep abreast of job market shifts for their graduates. They specifically need to answer these questions: What changes have occurred in the types of jobs graduates have obtained? How do today's graduates compare with graduates in earlier years in financial terms? Have there been shifts in the level of job satisfaction? Have the jobs secured by graduates become more or less related to their collegiate majors? Are the graduates more or less often unemployed or underemployed than previously? Have the attitudes of graduates towards their college or major field altered? Not only should those officials be aware of trends in such variables, but they also ought to be able to relate the trends to the general job market for college graduates. It is equally important that they know to what extent they can apply the available information about the the general market for graduates to their own graduates. If the data for a specific institution's graduates essentially mirror the general information, that institution perhaps could rely totally on the general information, and thus avoid the effort of collecting information about the adjustment of its own graduates to the world of work.

Few universities have the data needed to answer these and related questions about their graduates. The University of Illinois is one of those few. The University has developed a computerized system for monitoring the adjustment of its graduates to the job market and can trace trends in the job market for the graduates of its academic programs. That system is based on a series of follow-up surveys of graduates covering a period of more than a decade.

The University has a student enrollment of approximately 60,000 and offers a broad spectrum of curricular programs at all degree levels, including the major professional fields. The entering freshmen at its Urbana-Champaign campus have an average ACT:Composite test score of about 26; at its Chicago campus, 20. The average high school percentile rank for its Urbana-Champaign campus is 88; for its Chicago campus, 74. The University's total operating budget for the current fiscal year is just over one billion dollars, with about half of the total coming from state appropriations and the remaining half from contracts and grants, federal land-grant appropriations, private gifts, and student charges. According to a 1982 study by the Conference Board of Associated Research Councils, of graduate program faculty in 32 disciplines, the University's Urbana-Champaign campus programs were ranked among the top twenty institutions nationally in 24 of those disciplines, and among the top ten institutions in 11 of them.

Development and Nature of Monitoring System

The University of Illinois initiated its studies of graduates with a survey of the 1972 class. That survey was conducted in great part to answer questions related to the prevailing image of that time of recent graduates with Ph.D. degrees who were unable to obtain suitable employment. The administration of the University soon decided to begin annual surveys of its graduates, and a schedule was developed to carry out the plan. The schedule called for the interspersing of one-year-out, five-year-out, and ten-year-out studies. It was designed to allow for repeated surveys of certain graduating classes to permit study of the experiences and perceptions of the same graduates over time.

The initial series of surveys covered an eleven-year period, from 1973 through 1983, and produced the following ten surveys:

Year of Survey	Year of Graduation	Type of Survey
1973	1972	one-year
1974	1973	one-year
1975	1970	five-year
1976	1975	one-year
1977	1976	one-year
1978	1973	five-year
1979	1978	one-year
1981	1976	five-year
1982	1981	one-year
1983	1973	ten-year

That initial series of ten surveys thus included six surveys that were conducted one year following graduation, three five-year-out surveys, and a single ten-year-out study. One graduating class, the 1973 class, was surveyed at all three points following graduation. A second class, the 1976 class, was surveyed twice, after one and five years. Every survey except the first one, the 1973 study of the 1972 class, was a census survey, with all graduates of the two campuses of the University being sent questionnaires. Typically, about 12,000 graduates were included in each survey. The response rates varied somewhat from year to year, but all were in the 50 and 60 percent range. A telephone follow-up survey of nonrespondents of one of the early one-year-out surveys was carried out to dispel the fears of response bias. No statistically significant differences were found between the results from the telephone survey and those from the basic mail survey, and the mail survey results accordingly were concluded to be representative of the classes being surveyed.

Approximately one third of the content of the surveys is devoted to vocational questions, twenty percent to the post-graduation educational experiences of those graduates, and the remaining half to the respondents' attitudes about and assessments of the institution and its programs.

The job-related results from the surveys include data related to the following parameters or variables: employment status (e.g., whether employed or not); name and type of employer; where employed; job title and principal responsibilities; relationship between job and college major;

perceived helpfulness of college major in job duties; degree of job satisfaction; degree of perceived underemployment; salary; when the first post-graduation job was secured; and whether still in first job.

The University's program for monitoring the experiences of its graduates requires only a minor commitment of resources. The budget for the next scheduled survey, a ten-year-out study of the 1976 class, calls for an expenditure of about $50,000. No amount has been budgeted for data entry or for computer time, since the cost of these items is not passed on to user departments at the University. A reasonable estimate for computer related costs would be between $25,000 and $50,000. Thus, the entire cost to the University for the upcoming survey will be, at most, about $100,000. This amount will represent only about one ten-thousandth of the institutions's total operating budget.

Users of Data From Monitoring System

To date the data from the system for monitoring the experiences and perceptions of graduates have been used more intensively by the Urbana-Champaign campus than by the Chicago campus, at least in a formally structured sense.

A formal system for program review has been in operation at the Urbana-Champaign campus for a number of years, and results from the surveys of graduates have been a small, but integral, part of that process almost from its inception.

The Center for Career Development and Placement at Urbana-Champaign has been a strong supporter of the monitoring system, and has developed varied materials for the career counseling use of students.

The Office of Admissions and Records also has made use of the survey results. Selected data have been incorporated in materials provided to high school counselors. In addition, summary survey data have been made a part of the information packets that routinely are sent to applicants for admission to the University.

Finally, the data from the survey have been used by the University for public relations purposes, primarily in furnishing information to the Legislature and the Governor's office.

Trends in the Survey Data

This section of the paper analyzes the trends that have occurred among graduates of the University of Illinois over the eleven-year period covered by its first series of surveys of graduates.

The data have been delimited in several respects to make the analysis more manageable. First, only bachelor's graduates of the University (both campuses combined) have been included in the sample of graduates. Second, the primary data analysis has been limited to the five one-year-out census surveys plus the series of three surveys performed on the class of 1973. This limitation has made it possible to focus on both cross-sectional and longitudinal trends, each of which is important to an understanding of

adjustment of graduates to the job market. Third, the analysis has been restricted to graduates in business, education, engineering, mathematics and sciences (including the physical and life sciences), social sciences, and humanities. Three of these six disciplines, business, education, and engineering, usually permit entry into related fields upon receipt of the bachelor's degree, whereas the other three disciplines, mathematics and sciences, social sciences, and humanities, often require additional education before entering related fields. The curricula comprising the six disciplines produce about 70 percent of the University's bachelor's degrees. Finally, the analysis has been limited to six of the almost forty data questions or parameters covered by the surveys. These parameters have been selected because they presumably provide indications of the vocational success of the graduates along two principal dimensions; (1) the ease with which they secured employment, and (2) the suitability of the jobs they were able to obtain. The parameters selected to reflect the first dimension are "unemployment rate" and "time required to obtain the first job" (The latter parameter was applied only for the one-year-out surveys.). Those chosen for the second dimension are "job satisfaction," "attitude toward the college major," and "salary." One other parameter, "additional degrees received", has been included for the longitudinal trend analysis.

Data relating to the general trends in the job market for college graduates for the time period of the surveys have been derived from results from the "Endicott Report." That report, published annually for almost forty years by The Placement Center at Northwestern University, includes data on the number of bachelor's graduates of various disciplines who have been employed by firms during the previous year. Those data were used to derive the average number of graduates hired annually per firm for each of several disciplines. The derived averages were then used to determine the job market trends for those fields. It was concluded from the averages that, during the period of time covered by the University's surveys, the job market for engineering and business bachelor's graduates improved, the job market for liberal arts graduates deteriorated, and there was little change in the market for graduates of mathematics and sciences. The "Endicott Report" does not provide data separately for either the social sciences or education. While no data have been discovered concerning the job market for graduates of the social sciences during the period of the surveys, it is a well known fact that the job market for school teachers deteriorated during those years.

Cross-sectional Trends (One-year-out Results)

The discussion of the one-year-out survey results for each parameter will emphasize interdisciplinary differences as well as intradisciplinary trends. Trends observed in the survey data will be compared with the changes known to have occurred in the general job market for college graduates.

Unemployment rate is the first of the two measures related to difficulty of obtaining employment. The surveys have defined unemployment as the percentage of graduates not employed but seeking employment. Table 1 provides the results for this variable for the five one-year-out surveys. The tabled data show that the median unemployment rates ranged fairly widely, between about three percent and about seven percent, with engineering graduates exhibiting the lowest average rates and graduates in

TABLE 1

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: UNEMPLOYMENT RATE

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	3.4%	3.3%	2.9%	3.8%	9.0%	6.8%
1976	4.7%	4.3%	4.8%	4.0%	6.8%	7.3%
1977	2.3%	2.6%	2.1%	2.6%	5.0%	7.8%
1979	1.8%	7.5%	1.7%	2.0%	5.8%	5.2%
1982	5.2%	5.0%	3.6%	3.9%	8.8%	4.9%
MEDIAN	3.4%	4.3%	2.9%	3.8%	6.8%	6.8%

social sciences and humanities the highest. Business and mathematics and sciences exhibited relatively low rates (under four percent), and education was somewhat higher (over four percent).

The unemployment data show some increase over time in the rates for education and business graduates and a decrease for humanities graduates. Only the shift for education is consistent with what is known about the general job market for college graduates over the time period covered.

The unemployment rates for the six disciplines perhaps can be placed in better perspective by comparing them to the unemployment levels in the State of Illinois during the same period. (Most bachelor's graduates from the University of Illinois remain in the state following graduation.) Business, engineering, and mathematics and sciences consistently were below the statewide rates. Education was below the state rate except for a single year. In contrast, the unemployment rates both for the social sciences and humanities were below the state rates only for two of the five years involved. During the year of the final survey, 1982, the Illinois state unemployment rate of 11.3% was considerably above the rate for every one of the six disciplines. One would expect unemployment levels for college graduates to be below the rates for the general population. Except for social sciences and humanities this expectation held.

Time required to secure the first job, the second variable related to difficulty in securing employment, also differentiated between field of study, but not always as the conventional wisdom would suggest.

The first measure of this variable to be discussed is the percent of employed graduates who secured the initial employment before graduation (Table 2). At least three fourths of the engineering graduates on average obtained their first jobs prior to graduation. Contrary to common perception, the business graduates did not do as well. In fact, the percentage for business majors (about 55%) was about the same as the rate for humanities, and only marginally higher than those for mathematics and sciences and social sciences. In contrast to the other fields, only about one fourth of education graduates obtained their jobs prior to graduation. Hiring patterns in the elementary and secondary schools differ from those in industry. Hiring levels for the next school year often are not known until well after the end of the spring term. This situation probably helps to account for the low rate for education.

The second measure of time required to obtain a job is the distribution for graduates who obtained jobs after graduation. Table 3 distinguishes between graduates who secured jobs in "fewer than 12 weeks," and those who took "more than 12 weeks." These data show that, for each discipline except engineering, at least 30 percent of graduates obtained employment during the first twelve weeks after graduation; the rate was over 50% for education graduates. Despite this surge, at least 15% to 20% of graduates in every field, except engineering, typically required more than twelve weeks to obtain their jobs.

The graduates of four of the disciplines exhibited some tightening of the job market during the time period covered by the surveys, as reflected by an increase in time required to obtain jobs. Relatively fewer education graduates secured their jobs prior to graduation, and relatively

TABLE 2

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: SECURED FIRST JOB PRIOR TO GRADUATION

YEAR OF SURVEY	DISCIPLINE					
	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	60.2%	35.2%	77.1%	45.9%	41.1%	54.1%
1977	46.6%	18.7%	74.3%	44.9%	36.9%	47.3%
1979	53.8%	27.5%	84.2%	49.6%	40.7%	54.2%
1982	54.0%	22.0%	78.5%	46.6%	37.5%	55.0%
MEDIAN	53.9%	24.8%	77.8%	46.3%	39.1%	54.2%

DATA NOT AVAILABLE FOR 1976

TABLE 3

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: SECURED FIRST JOB AFTER GRADUATION

YEAR OF SURVEY	DISCIPLINE					
	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
FEWER THAN 12 WEEKS						
1974	32.5%	56.2%	18.7%	43.8%	44.7%	36.5%
1977	36.4%	77.2%	17.9%	37.8%	41.3%	37.0%
1979	31.9%	54.5%	11.6%	34.8%	37.9%	32.4%
1982	29.3%	53.8%	14.1%	26.9%	39.6%	28.3%
MORE THAN 12 WEEKS						
1974	7.3%	8.6%	4.2%	10.3%	14.2%	9.4%
1977	17.0%	22.8%	7.8%	17.3%	21.8%	15.7%
1979	14.3%	18.0%	4.2%	15.6%	21.4%	13.4%
1982	16.7%	24.2%	7.4%	26.5%	22.9%	16.7%

more did not succeed until after the first twelve-week period. The shifts for the other three disciplines, mathematics and sciences, social sciences, and humanities, were less severe, being characterized as decreases in the percentages obtaining jobs during the twelve weeks following graduation and increases for the period after the twelve-week point. The shifts for education and humanities were consistent with the changes that occurred generally for college graduates.

Job satisfaction is the first measure of suitability of employment to be examined. The graduates surveyed were asked to describe their level of job satisfaction as being "a great deal," "somewhat," "very little," or "none." The results for this parameter have been analyzed for the high satisfaction response ("a great deal") and for the combination of the first two of the four response choices ("a great deal" and "somewhat"). The combined response analysis could be viewed as an "overall job satisfaction" rate.

Table 4 shows the percentages of graduates who answered that they received "a great deal" of satisfaction from their jobs. The results indicate that graduates of the three more-career-oriented disciplines, engineering, education, and business, were the most satisfied with their jobs. More than half of each of these three groups of graduates, on average, evidenced high job satisfaction, with engineering showing the highest median, almost 60%. The remaining three fields, the less-career-oriented ones, showed fewer high job satisfaction responses, ranging between about 30% and 45%.

Table 5 shows the combined data for graduates who answered that they were "a great deal" or "somewhat" satisfied with their jobs. The interdisciplinary patterns are similar to those observed for the high satisfaction data, but the level for all fields is clearly higher. The combination of the two positive responses produced job satisfaction rates of about 90% or above for the three career-oriented fields, and between about two thirds and three fourths for the other three fields.

The results on the job satisfaction parameter show only relatively minor shifts over time for individual disciplines. A modest increase in satisfaction levels is shown for social sciences graduates in both the high-satisfaction-rate and overall-job-satisfaction rate analyses. The data for the remaining five disciplines appear relatively stable.

Attitude toward the college major is another measure of suitability of employment. The graduates who were surveyed could indicate that they felt "strongly positive", "moderately positive", "moderately negative", or "strongly negative" toward their majors. The results for this parameter have been examined both for the high-satisfaction response, "strongly positive", and for the combination of the first two of the response choices ("strongly positive" and "moderately positive").

Table 6 shows the results for graduates who answered that they had "strongly positive" feelings toward their majors. Engineering led on this measure with a median of about 60 percent of the graduates. Business followed with about 50 percent. Social sciences graduates exhibited a much lower average rate of about 25 percent. Education, mathematics and sciences, and humanities were quite similar to one another, each showing a median rate between 37% and 39%.

TABLE 4

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: JOB SATISFACTION -- "A GREAT DEAL"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	54.6%	63.0%	55.0%	36.0%	28.6%	38.3%
1976	49.0%	52.0%	59.1%	46.3%	30.9%	33.3%
1977	51.9%	49.6%	61.3%	36.8%	36.1%	27.9%
1979	52.5%	54.8%	62.0%	47.6%	34.7%	31.3%
1982	50.9%	63.5%	58.2%	45.5%	39.0%	31.5%
MEDIAN	51.9%	54.8%	59.1%	45.5%	34.7%	31.5%

TABLE 5

CROSS SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: JOB SATISFACTION -- "A GREAT DEAL" AND "SOMEWHAT"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	89.8%	89.1%	96.2%	78.9%	66.3%	66.4%
1976	84.4%	89.1%	92.1%	78.5%	63.9%	70.2%
1977	86.5%	84.3%	94.4%	77.0%	70.0%	63.7%
1979	91.4%	90.5%	94.4%	84.4%	75.5%	76.1%
1982	90.6%	88.0%	93.6%	85.8%	79.6%	67.5%
MEDIAN	89.8%	89.1%	94.4%	78.9%	70.0%	67.5%

TABLE 6

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: ATTITUDE TOWARD COLLEGE MAJOR -- "STRONGLY POSITIVE"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	47.5%	35.0%	55.1%	31.0%	28.3%	37.7%
1976	45.3%	38.4%	57.4%	41.0%	26.2%	37.5%
1977	53.7%	30.9%	60.7%	37.0%	25.2%	32.2%
1979	51.8%	37.2%	64.5%	38.5%	24.7%	39.1%
1982	51.8%	37.9%	61.6%	44.2%	26.8%	43.5%
MEDIAN	51.8%	37.2%	60.7%	38.5%	26.2%	37.7%

Table 7 shows the attitude-toward-the-major data for the combination of the "strongly positive" and "moderately positive" responses. The order of the six fields was the same as for the previous analysis, but the percentages of course were much higher. The medians for engineering and business each were above 90%. Those for mathematics and sciences, humanities, and education were in the low to the mid 80% range. About three fourths of the social sciences majors on average recorded positive responses.

An improvement in attitude toward the major was shown, over the time period being examined, for mathematics and sciences graduates; otherwise the results were quite stable for the disciplines. Thus, no trends occurred which could have been anticipated by the general shifts in the job market for college graduates.

Salary is the final measure of job suitability. An average salary index has been used. The index compares the average salary for a particular discipline to the overall salary average for all responding bachelor's graduates for a given survey. Disciplines with indices above 1.00 had average salaries above the overall average, and those with indices below 1.00 had average salaries lower than the overall average. Again, the differences among the six disciplines are marked (Table 8). Engineering and business graduates reflected the highest relative salaries. The median index for engineering was 1.29; the median index for business, 1.09. The median indices for the remaining four fields indicated that their average salaries, on average, were between about 15 percent and 20 percent below the overall institution average. The lowest average salary index shown was for humanities graduates.

The average salary indices suggest that the salary situation for business, education, and humanities graduates deteriorated during the period of the surveys. Engineering graduates increased their relative position slightly. These trends, except the one shown for business, were consistent with the general trends in the job market for graduates.

Several common themes have been observed in the results from the five one-year-out surveys. First, there were rather marked interdisciplinary differences for every parameter examined. Second, a strong consistency occurs in the interdisciplinary patterns for the various parameters. For virtually every parameter, engineering produced the most positive results and business followed with the next most positive picture. Thus, among the three more-career-oriented fields, only education graduates appear not to have fared especially well, in a comparative sense, on the parameters being considered. The humanities and social sciences graduates generally were at the negative end of the distribution of six disciplines. Third, the intradisciplinary shifts that occurred during the time covered by the surveys tended to be rather modest in magnitude, and, except for those concerning salary, often were not in the anticipated direction. The discipline for which the trends shown by the survey results were most often in the direction indicated by the general job market trends was education, and even that field failed to reflect the expected downturn in two of the parameters, job satisfaction and attitude toward the major. The graduates included in this analysis apparently were sheltered to a considerable degree from the dislocations that were occurring for college graduates generally during the years covered by the surveys.

TABLE 7

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: ATTITUDE TOWARD MAJOR--"STRONGLY POSITIVE" AND "MODERATELY POSITIVE"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	87.8%	85.1%	93.6%	73.1%	75.5%	83.3%
1976	92.0%	87.1%	94.8%	88.1%	73.6%	85.1%
1977	92.0%	78.9%	94.2%	84.6%	74.3%	79 9%
1979	92.9%	83.1%	96.2%	84.9%	72.0%	81.6%
1982	92.3%	81.3%	96.2%	92.1%	81.1%	85.5%
MEDIAN	92.0%	83.1%	94.8%	84.9%	74.3%	83.3%

TABLE 8

CROSS-SECTIONAL TREND ANALYSIS
BACHELOR'S GRADUATES
(ONE YEAR AFTER GRADUATION)

PARAMETER: AVERAGE SALARY INDEX

YEAR OF SURVEY	DISCIPLINE					
	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	1.13	.85	1.26	.96	.86	.83
1976	1.07	.88	1.29	.92	.82	.79
1977	1.08	.83	1.28	.94	.85	.81
1979	1.04	.76	1.33	.97	.85	.80
1982	.99	.68	1.34	.95	.78	.70
MEDIAN	1.07	.83	1.29	.95	.85	.80

Longitudinal Trends

The one-year-out survey results permit an analysis of what has happened over a specific time period to different graduating classes. The longitudinal data from the three surveys of the class of 1973, which now will be examined, provide the opportunity to analyze changes which have occurred over time for a single class. The 1973 class results should give insights concerning the effect of intervening work and educational experiences on the graduates of the six disciplines.

The results on unemployment rate for the class of 1973, shown in Table 9, indicate that the incidence of unemployment decreased dramatically for most of the fields between the points in time represented by the one-year-out and the ten-year-out surveys. The only exception, education, showed a rate of unemployment which remained at about the 3 percent level for all three surveys. The largest nominal decreases in the rates occurred for the two disciplines that showed the highest initial rates, social sciences and humanities. Accordingly, the six disciplines converged considerably over the time interval on this variable. In fact, unemployment was no higher than 2.5% for any discipline, except education, by the ten-year-out point.

The job satisfaction data present a picture not dissimilar from that already noted for unemployment. Again, the initial gap among the six fields was greatly reduced by the ten-year-out point. This pattern is exhibited for both the high-job-satisfaction data in Table 10, and the overall-job-satisfaction data in Table 11. At least 60 percent of graduates of every field, except humanities, were highly satisfied with their jobs ten years after graduation; and even the humanities graduates were above 50%. For the overall-job-satisfaction measure (the combination of "a great deal" and "somewhat" satisfied), the rate for humanities increased to almost 90%, and the other five disciplines to over 90%. Three disciplines, engineering, mathematics and sciences, and business exceeded 95% on the overall-job-satisfaction measure. Two other aspects of the data are similar to the results for unemployment rate. First, education, which showed the highest initial level on the high-job-satisfaction measure, again was the only discipline not reflecting any improvement. Second, the fields which evidenced the lowest one-year-out job satisfaction levels, social sciences, mathematics and sciences, and humanities, reflected the largest nominal increases for the two satisfaction indices.

The data dealing with attitude of the 1973 class graduates toward their college majors show patterns which differ from those observed for unemployment and job satisfaction. For this variable, the degree of improvement shown over time among the disciplines is both less dramatic and less prevalent (Tables 12 and 13). For both measures of attitude toward the major, only graduates of business and mathematics and sciences exhibited a higher incidence over time, and those increases were modest ones. The pattern of change for this parameter also fails to reflect the sharp reduction in the initial interdisciplinary differences. As a result, the ten-year-out rates for both measures show wide variation even at the ten-year-out point, varying from 24 percent for social sciences to 59 percent for engineering for the "strongly positive" measure, and ranging from 75 percent for social sciences to 96 percent for engineering for the combined measure.

TABLE 9

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: UNEMPLOYMENT RATE

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	3.4%	3.3%	2.9%	3.8%	9.0%	6.8%
1978	1.5%	3.0%	.5%	3.0%	4.0%	5.0%
1983	.7%	3.0%	1.0%	1.3%	2.5%	2.1%

TABLE 10

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: JOB SATISFACTION -- "A GREAT DEAL"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	54.6%	63.0%	55.0%	36.0%	28.6%	38.3%
1978	59.7%	62.6%	57.1%	65.2%	51.2%	52.1%
1983	65.0%	61.0%	67.2%	65.3%	61.7%	54.0%

TABLE 11

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: JOB SATISFACTION -- "A GREAT DEAL" AND "SOMEWHAT"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	89.8%	89.1%	96.2%	78.9%	66.3%	66.4%
1978	94.3%	92.7%	95.9%	92.6%	87.7%	87.3%
1983	96.8%	92.5%	98.2%	97.1%	93.8%	88.4%

TABLE 12

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: ATTITUDE TOWARD THE COLLEGE MAJOR--"STRONGLY POSITIVE"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	47.5%	35.0%	55.1%	31.0%	28.3%	37.7%
1978	45.5%	31.0%	52.4%	34.6%	16.2%	24.9%
1983	55.1%	35.5%	58.6%	39.6%	24.0%	28.6%

TABLE 13

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: ATTITUDE TOWARD COLLEGE MAJOR--"STRONGLY POSITIVE" AND "MODERATELY POSITIVE"

	DISCIPLINE					
YEAR OF SURVEY	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	87.8%	85.1%	93.6%	73.1%	75.5%	83.3%
1978	89.9%	71.1%	93.2%	84.1%	65.7%	70.6%
1983	93.3%	83.2%	95.7%	90.5%	75.1%	80.0%

Salary data have been analyzed using an average salary growth index which, by setting each initial salary average at 100, permits ready comparison of the degree of salary increase over time among the six disciplines. Table 14 displays these average salary growth indices for the six fields during the period between the initial and the third surveys. The indices show both winners and losers among the disciplines for the class of 1973. The business and mathematics and sciences graduates were winners. They started the period with the second and third highest average salaries, and yet were the two disciplines with the highest percentage increases, each showing a growth in excess of 300 percent. As a result, both disciplines were able to move ahead of engineering by the ten-year-out point. Among the losers were the graduates in humanities and education, which not only had the lowest initial average salaries, but also had relatively low percentage increases over the nine-year period. Education, in fact, was the only discipline unable to achieve at least a 200 percent increase over the period. These low salary growth rates meant that both education and humanities, especially the former, lost ground to the disciplines that were above them at the time of the one-year-out survey. Engineering, the field with the highest starting average salary, was outstripped in terms of its percentage increase over the period by every field except education. Thus, there were some rearrangements in average salary among the disciplines during the period of the three surveys, but the interdisciplinary differences remained large even ten years after graduation. As a matter of fact, the range between the highest and lowest average salaries was even wider, in percentage terms, at the time of the third survey than it initially had been.

The final variable to be discussed for the 1973 class deals with the additional degrees earned since receiving the bachelor's degree. As the data in Table 15 indicate, there were marked differences among the six fields of study, both in the propensity to obtain additional degrees and in the types of degrees earned. For each of the three more-career-oriented fields, business, education, and engineering, about one third of the graduates received additional degrees in the ten years since their original graduation, and most of those degrees were at the master's level. In contrast, almost two thirds of the mathematics and science graduates earned added degrees, and the social sciences and humanities graduates either approached or exceeded the 50% mark. Only for mathematics and sciences did a significant percentage of the graduates (18 percent) earn the MD degree. The same discipline produced by far the highest proportion (21 percent) of "other" degrees, largely Ph.D.s and professional degrees in dentistry and veterinary medicine. Most of the law degrees were earned by the graduates in social sciences (15 percent), humanities (8%), and business (7 percent). These patterns all seem consistent with the nature of the fields involved.

The data on additional degrees obtained since the baccalaureate offer certain insights into the changes that have been noted for the other parameters. The additional degrees earned by graduates in mathematics and sciences, social sciences, and humanities, the three disciplines reflecting the highest rates on this variable, no doubt improved their marketability in the world of work. Many of those graduates were full-time students enrolled for the additional degrees at the time of the initial survey, and thus were not included in the job-related data for that survey. When subsequently they completed their additional degrees,

TABLE 14

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: AVERAGE SALARY GROWTH INDEX

YEAR OF SURVEY	DISCIPLINE					
	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
1974	100.0	100.0	100.0	100.0	100.0	100.0
1978	188.8	162.0	174.3	181.2	193.8	176.5
1983	434.1	293.8	353.6	466.5	426.6	362.8
INITIAL AVERAGE SALARY	$10,452	$ 7,899	$11,657	$ 8,991	$7,946	$ 7,696
FINAL AVERAGE SALARY	$45,375	$23,206	$41,214	$41,477	$33,896	$27,923

TABLE 15

LONGITUDINAL TREND ANALYSIS
BACHELOR'S GRADUATES
(CLASS OF 1973)

PARAMETER: ADDITIONAL DEGREES HELD

	DISCIPLINE					
	BUSINESS	EDUCATION	ENGINEERING	MATHEMATICS & SCIENCES	SOCIAL SCIENCES	HUMANITIES
MASTERS	24.6%	33.0%	30.3%	23.5%	29.5%	34.6%
LAW	6.9%	1.1%	1.6%	2.0%	14.7%	7.8%
MEDICINE	0%	0%	1.4%	18.3%	2.0%	0%
OTHER	1.0%	1.5%	3.3%	20.6%	8.7%	4.6%
TOTAL	32.5%	35.6%	36.6%	64.4%	54.9%	47.0%

DATA CURRENT AS OF 1983--TEN YEARS OUT.

often in a different field (including medicine or law), or at a higher degree level (masters and doctorates), they tended to enter different segments of the employment market than was the case for those graduates who did not pursue added education. The jobs the more educated graduates eventually obtained generally were higher paying jobs in careers that they consciously selected. This situation no doubt led to improvements in the job related parameters for the three disciplines involved. By contrast, graduates of the career-oriented fields, business, education, and engineering, probably would have less often shifted careers, and thus tended to show less marked changes on those parameters.

The longitudinal data for the class of 1973 present several rather clear trends for those graduates. To begin with, a definite picture of overall improvement emerges on most parameters during the time between the one-year-out and the ten-year-out surveys. In addition, for both unemployment and job satisfaction, there is a decided closing of the interdisciplinary gaps found at the time of the intitial survey. This narrowing of the differences among the disciplines fails to materialize for the other two parameters, attitude toward the college major and salary. For attitude toward the college major, there is little if any change over time, and the imitial gaps accordingly persist. The data for average salary show general increases in salaries for every discipline, but also an actual widening of the earlier gaps. The results for the graduates of the various disciplines exhibit a generally positive picture at the ten-year-out point in terms of the adjustments of the graduates to the world of work.

Possible Future Developments

The University of Illinois' system for monitoring its graduates and their vocationally related experiences and perceptions has presented several frustrating but solvable problems for the institution and for those persons who have worked most closely with the system. The potential improvements designed to ameliorate the problems are outlined and discussed below.

The relatively large amount of time and clerical effort required by these annual surveys constitutes one of the problem areas. Typically, it has taken about a year from the time a survey is conducted until results are available for use. Much of this delay has been caused by the need for clerical coding of as many as 6,000 to 7,000 returned questionnaires. The University must seek a more automated means for data entry. Plans already have been made to explore the feasibility of developing an optical scan survey form. A key factor to be assessed in connection with this potential development would seem to be whether the turnaround time would be shortened sufficiently to warrant any loss in data specificity. In addition, it will be necessary to examine to what extent an altered questionnaire format would affect the response rate of the graduates surveyed.

Date retrieval poses a second problem area. Data analysis has been considerably limited as to format and type. Basically, the analyses have consisted of frequency and percentage counts by degree level within department or college, or for an entire campus. These analyses, furthermore, have been provided separately for each questionnaire

parameter or item (e.g., job satisfaction). There has been a tendency in the past to discourage requests for analyses that differ from the standard ones. A more flexible data retrieval system is needed if the institution is to begin to actively encourage such varied data needs. The solution to this problem probably lies in the use of one of the commercially available software packages, either a spreadsheet or a data base package.

Another problem with the monitoring system and its data relates to the difficulty in interpreting the data. Specifically, there seems to be an almost total lack of comparative data for other institutions. One of the greatest impediments to involvement by other institutions in this area of activity probably involves the perceived high cost to develop and maintain a system for monitoring graduates. A possible solution to this problem might be found in several kinds of effort. First, other institutions possibly could be persuaded, through the dissemination of the actual cost experiences of a few institutions, that the cost is not prohibitive in view of the potential value to be derived from the data. Second, arrangements conceivably could be developed that would permit consortia of institutions to share certain costs, and therefore to benefit from economies of scale. for example, common survey forms might be used by more than one institution, thus saving on printing and developmental costs.

Finally, little is known about the dynamics of the survey forms used for data collection. Studies are needed of relationships among the variables; such studies could lead to shortened forms. In addition, the survey data ought to be studied in relation to other data available about former students (e.g., background and personal information and degree of success while enrolled). This problem could be addressed by greater use of the monitoring system data for dissertation research. This goal could be realized through an increased effort to inform faculty members and others in academic departments about the existence, availability, and scope of the data in the monitoring system.

Conclusions and Implications

The results from the series of one-year-out surveys of graduates conducted by the University of Illinois clearly show relatively sharp differences in adjustment of graduates to the job market among the disciplines examined in the study. Those differences, because they are so consistent over time, appear to be relatively isolated from shifts known to have occurred in the job market for graduates. There are two possible explanations for this tendency for the survey data not to match the general job market patterns. College students typically move toward majors that recently have presented a favorable job market picture, and away from majors for which the market has been relatively tight. Their behavior could greatly soften the impact of shifts in the job market for graduates. It also is reasonable to assume that the job market has a considerable elasticity with regard to its need for college graduates. Excess supplies of graduates in particular disciplines probably are absorbed by the market at the expense of job applicants with lesser academic credentials, while shortages in other disciplines are handled by employing graduates in less relevant disciplines.

The findings from the longitudinal survey data just as vividly demonstrate that the initial interdisciplinary distinctions shown for several of the job related parameters analyzed in the study lessen considerably over the first ten years following graduation. This closing of the early gaps seems to be related to a tendency for graduates of certain disciplines to move into the professional fields through additional education. The graduates of the disciplines studied appear to have made satisfactory adjustments to the job market by the ten-year-out point.

The survey results have implications for colleges and universities. It is apparent that institutions cannot fully rely on available information regarding the general job market for graduates. The post-graduation experiences of their own graduates do not necessarily match the trends suggested by that information. Moreover, institutions ought to study the career activities of their graduates beyond the first year or so following graduation if they want to gain a more complete and accurate understanding of the dynamics of the adjustment of those graduates to the world of work.